EFFICACY STUDY REVIEW

by Kevin J. Sweeney, Entomologist - IB Kevin J Sweeney 1/10/2000

To: File

Through: Mark Dow MD 01/10/2000

Date: January 10, 2000

EPA Reg. No. 9688-134

Product Name: Chemsico Insect Bait A - "Terminate"

Registrant: Chemsico - Division of United Industries

PM: George LaRocca

Action: 570

Submission Nos. S559236 & S572064 DP: D254686 & D261481

Chemical: 0.01% sulfluramid Type: (I) Insecticide

Studies Submitted:

MRID 447713-01 entitled: Second Report on the Efficacy of Chemsico Bait A Against Subterranean Termites Around Homes in Lowndes County, GA , MRID 447713-02 entitled Second Report on the Efficacy in Yosemite, California of Chemsico Insect Bait A, and MRID 449676-00 entitled the Third Report on the Efficacy in Yosemite, California of Chemsico Insect Bait A.

These are a series of interim reports submitted to comply with the conditions of the registration. The study sites are located in Lowndes, Georgia and Yosemite National Park in California. Preventive treatment plots were established in Georgia and preventive and remedial treatment plots in Yosemite National Park. The registrant documented the nature and size of the structures, bait placement, and termite activity at each site. Wood stakes were placed between bait stations to monitor termite feeding and foraging behavior in these studies.

Conclusions and Recommendations:

1. Please revise the methods section to include an explanation of how % bait consumption was calculated.

2. There appears to be no correlation between bait consumption and monitoring stake damage, although a statistical analysis have not been performed. At many of the homes, termites damaged groups of adjacent monitoring stakes but did not consume adjacent bait stations. Conversely, baits fed on by the termites early in the season did not decrease termite foraging in the area in the same season as shown by feeding on the stakes adjacent to the bait station. In the Lowndes study, there is a trend that suggests there is a preference for the wooden stakes over the bait stations. The author concluded that the stakes were more attractive to the foraging termites because "the monitoring stakes were made of solid wood blocks and were larger than the Terminate bait stakes. Due to its larger mass and size, the monitor reached deeper into the soil and had more surface areas than the bait station (stake)." If this is true, then termites should have: 1) always bypassed a bait station and infested the structure because it provides a wealth of cellulose; and 2) preferred the bait less than other wood products (landscape timbers, fences, etc.) and structures.

3. Termite inspection in the structure was done by visual methods. If a termite infestation exists in wood members that are not visible, it can not be detected by this method. Therefore, an acoustical emission device should be used to help locate unseen infestations.

4. **I do not believe that enough data has been collected to demonstrate the effectiveness of Terminate as a preventive treatment.** Based on the data submitted to date I do not agree with the author's suggestion that the application of Terminate bait reduced or suppressed the termite population. In the Yosemite study, this bait has not been entirely successful in remedial treatments and results from preventive treatments are inconclusive. If the bait is performing as intended (that is, to protect the structure by reducing or eliminating the local termite population), feeding on the baits and the stakes should decrease and in many cases cease entirely. However, termite feeding at stakes adjacent to previously active bait stations did not decrease or cease. This shows that the bait has not reduced the population but rather that the termites moved from one area to another. The reason for this movement could not be determined from the collected data but may be based on a preference for untreated wood or as a behavioral avoidance of bait stations.

5. The Yosemite site was a good selection because National Park properties receive limited, if any, insecticide treatment. However, the altitude, short season, and winter temperatures are not conducive to termite survival and activity. A warm moist climate where a known termite population exists would be better for future evaluations.

6. To measure population reduction, it will be necessary to install and monitor bucket traps. Monitor wood consumption at these stations so baits will not have to be weighed regularly. Collect termites from bucket traps at each structure and use antagonistic behavior (fight to the death) to determine if continued termite activity at the trap is the result bait ineffectiveness or is

due to an infestation from a new population. Mark/recapture techniques could also be employed.

7. The published data on the efficacy of sulfluramid termiticide baits are limited. None of the published studies document the success of this chemical as a termiticide capable of providing structural protection.

8. The data were not subjected to a statistical analysis and this should included in the final report to determine the statistical significance of the results.

9. These studies were performed by professionals. If we are to know if consumers can follow the product directions to achieve the desired result, tests must be done with consumers.

10. Unlike the Yosemite study, the Lowndes homes have a history of insecticide treatment. Spot treatments were made to several of the structures to eliminate existing termite infestations. Study results could be affected if these spot treatments were made with repellent pyrethroid termiticides because foraging termites may avoid bait stations and/or monitoring stakes placed near or in treated soil. Therefore, documentation on insecticide treatment history is required.

12. For the remainder of the study, the following changes should be made to the protocol:

a. In addition to wood monitoring stakes, bucket traps should be installed at each structure. An acoustical emission device should be used during each structural inspection to help locate termite infestations.

b. The structural inspection procedure must be described as part of the protocol/methods for this study together with the inspection forms.

c. Document the insecticide use history for each structure to include treatment dates, insecticide used, and locations of treatment.

d. Additional sites in southeastern states should be established.

e. Establish a consumer use study and measure consumer ability to: 1) purchase the proper size box; 2) place baits according to the instructions; 3) monitor the baits according to the instructions; 4) distinguish winged adult ants and from winged adult termites; 5) identify a conducive area as described on the label; 6) identify signs of termite infestation or damage; and 7) kill termites with the bait.

In response to modifications to the protocol suggested in my 1998 review.

1. Use the ASTM scale for describing visual damage to wood. Determine the amount of bait consumed by weighing each bait every 30 days. Any percent calculations used for comparative purposes should be based on changes in bait weights.

The registrant responded in a follow-up meeting that it was difficult to do item #1 because of the soil associated with the termite feeding and tunneling. Visual assessments were suggested according to a scale included with their study. At the time, EPA agreed with the registrant's suggestion, however, at this time some modification to the bait station may need to be made to accurately determine bait weight and consumption.

2. Monitor termite activity at a minimum of twelve untreated structures using wood stakes placed at ten foot intervals. This will provide untreated control data and reveal the nature and extent of termite feeding pressure and infestation in the entire study area. This type of data is currently not available and is invaluable to assessing the usefulness of termite baits as preventive treatments. It is most important to monitor activity on properties adjacent to the treated test plots since termite workers from resident termite colonies will forage in all directions.

In regards to item #2, there is no data included in this package that indicates that the registrant has begun to monitor termite populations in similar but untreated structures in the Lowndes County. This is necessary to provide an indicator of termite feeding pressure and populations in the area.

3. Employ a statistical test method to evaluate the data, whether it be ANOVA or a t-test. The experimental design should accommodate the assumptions for the statistical test used.

They have not addressed this request yet (see below).

4. Termites should not be allowed to consume all of the bait at any bait station location. If they do, they will probably not return. Baits must be replaced when heavily damaged.

The registrant agreed to items #3 & #4 and this analysis will be forthcoming when this study is complete.